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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/698,233	10/31/2003	Chihaya Adachi	10020/18103	2304
26646	7590	05/04/2007		
KENYON & KENYON LLP ONE BROADWAY NEW YORK, NY 10004			EXAMINER YAMNITZKY, MARIE ROSE	
			ART UNIT	PAPER NUMBER
			1774	
			MAIL DATE	DELIVERY MODE
			05/04/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/698,233

Applicant(s)

ADACHI ET AL.

Examiner

Marie R. Yamnitzky

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 12 February 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 39,41-50 and 52-60 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 39,41-50 and 52-60 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 12 Feb 2007.
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- ☐ Notice of Informal Patent Application
- ☐ Other: \_\_\_\_\_.

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after allowance or after an Office action under *Ex Parte Quayle*, 25 USPQ 74, 453 O.G. 213 (Comm'r Pat. 1935). Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, prosecution in this application has been reopened pursuant to 37 CFR 1.114. Applicant's submissions filed on February 12, 2007 (amendment to the specification, and IDS) have been entered.

Claims 39, 41-50 and 52-60 are pending.

2. The disclosure is objected to because of the following informalities:

The composition and structure of the device of Example 1 (pages 33-34 of the specification) is not clear. On page 33, reference is made to a second HTL consisting of TAZ, but TAZ is disclosed as an electron transporting material. Reference is then made to doping the first electron transporting layer with Ir(ppy)<sub>3</sub>. Since Example 1 makes no earlier reference to a first electron transporting layer, but TAZ is disclosed elsewhere as an electron transporting material, it is not clear if the layer of TAZ is actually the first electron transporting layer. On page 34, reference is made to injection of holes and electrons into the first electron transporting layer and carrier recombination in BCP, but the example does not previously describe formation of a layer comprising BCP. It is not clear if TAZ, BCP, a combination thereof, or neither, is the host material in Example 1.

Appropriate correction is required.

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 39, 41-50 and 52-60 are rejected under 35 U.S.C. 112, first paragraph, because the best mode contemplated by the inventor has not been disclosed. Evidence of concealment of the best mode is based upon Exhibit 1051, the Declaration of Daniel Nocera, Ph.D., filed February 12, 2007.

Exhibit 1051 provides evidence that at least some of the combinations of dopant and host disclosed in the examples set forth in the present specification do not meet the present claim limitations.

For example, given the teachings in the paragraph bridging pages 19-20 of the present specification regarding trapping of charge carriers, it appears that the combination of TAZ as host material and Ir(ppy)<sub>3</sub> as dopant would at least meet the relationship between dopant HOMO energy and host ionization potential as set forth in present independent claims 39 and 50. However, given the HOMO values set forth in Table 4 on page 22 of Exhibit 1051, and given paragraphs 52 and 55 on pages 14 and 15 of Exhibit 1051, the combination of TAZ as host and Ir(ppy)<sub>3</sub> as dopant does not meet the HOMO/ionization potential limitation of the present claims. (Given the LUMO values set forth in Table 5 on page 23 of Exhibit 1051, the combination of TAZ as host and Ir(ppy)<sub>3</sub> as dopant also does not meet the LUMO energy level relationship required by the present claims.)

Given the data presently available to the examiner, it is not clear whether there are any combinations of dopant and host materials disclosed in the present specification that meet all of the limitations of the dopant and host materials as required by independent claims 39 and 50.

5. Claims 39, 41-50 and 52-60 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claims contain subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

The application as originally filed provides insufficient guidance to make the invention commensurate in scope with the present claims without undue experimentation.

The present claims require an electron transporting host material and a phosphorescent dopant material having a specified relationship between HOMO energy of the dopant and ionization potential of the host, and having a specified relationship between LUMO energy level of the dopant and LUMO energy level of the host.

The specification teaches various exemplary materials for the dopant and host, and some of the present dependent claims limit the host or dopant to a disclosed exemplary material. However, based on data presented in Exhibit 1051 (the Declaration of Daniel Nocera, Ph.D., filed February 12, 2007), at least some of the exemplary combinations of dopant and host materials do not meet the present claim limitations. For example, Ir(ppy)<sub>3</sub> as dopant (the dopant required by present claims 49 and 60) with TAZ as host (the host required by present claims 44 and 55) or with BCP as host (the host required by present claims 46 and 57) do not meet the

dopant/host limitations required by the present independent claims. Given the data of record, it is not clear whether there are any combinations of dopant and host materials selected from the exemplified materials that actually meet all dopant/host limitations of the present independent claims. Given the large number of phosphorescent materials and electron transporting materials, and the showing that at least some of the exemplary combinations disclosed in the specification do not meet the claim limitations even though teachings in the specification suggest that they do, it is the examiner's position that it would require undue experimentation on the part of one skilled in the art to make the claimed invention.

6. During prosecution of parent Application No. 09/629,335 (now U.S. Patent No. 6,645,645), the examiner indicated that the article by Baldo et al. in *Nature*, Vol. 395, pp. 151-154 (September 10, 1998) was considered to be representative of the closest prior art as it discloses an organic light emitting device comprising an anode, a cathode and an emissive layer wherein the emissive layer comprises an electron transporting host material (Alq<sub>3</sub>) and a phosphorescent dopant material (PtOEP). It was the examiner's understanding that the combination of Alq<sub>3</sub> and PtOEP did not meet the relationship between the HOMO energy of the dopant and the ionization potential of the electron transporting host material as required by the now patented claims. The present claims require the same relationship between the HOMO energy of the dopant and the ionization potential of the electron transporting host material as required by the patented claims of the parent application.

Exhibit 1051 provides evidence that the combination of Alq<sub>3</sub> and PtOEP, which is disclosed in the Baldo article, does not meet the relationship between the HOMO energy of the dopant and the ionization potential of the electron transporting host material as required by the patented claims of the parent application and as required by the present claims. In particular, see Figure 3 on page 13 of Exhibit 1051, paragraph 52 on page 14 and paragraph 55 on page 15. Given the relationship between ionization potential and HOMO level as described, for example, in paragraphs 52 and 55, and given the HOMO levels for Alq<sub>3</sub> and PtOEP as shown in Figure 3, PtOEP (the phosphorescent dopant material) has a HOMO energy that is greater than the ionization potential of Alq<sub>3</sub> (the electron transporting host material).

However, Exhibit 1051 provides evidence that some of the combinations of dopant and host disclosed in the examples also do not meet the present claim limitations. Given the data presently available to the examiner, it is not clear whether there are any combinations of dopant and host materials disclosed in the original disclosure that meet all of the limitations of the dopant and host materials as required by present independent claims 39 and 50.

If the examiner has misinterpreted the claim limitations and/or teachings in the present disclosure and/or statements made and data presented in Exhibit 1051, the examiner welcomes clarification.

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7. Any inquiry concerning this communication should be directed to Marie R. Yamnitzky at telephone number (571) 272-1531. The examiner works a flexible schedule but can generally be reached at this number from 7:00 a.m. to 3:30 p.m. Monday-Friday.

The current fax number for all official faxes is (571) 273-8300. (Unofficial faxes to be sent directly to examiner Yamnitzky can be sent to (571) 273-1531.)

MRY  
May 01, 2007



**MARIE YAMNITZKY  
PRIMARY EXAMINER**

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